Agency for Healthcare Research and Quality
Advancing Excellence in Health Care

NATIONAL QUALITY MEASURES CLEARINGHOUSE

General

Title

Cataracts: percentage of patients aged 18 years and older in sample who had cataract surgery and had improvement in visual function achieved within 90 days following the cataract surgery, based on completing a pre-operative and postoperative visual function survey.

Source(s)

American Academy of Ophthalmology (AAO). Cataracts: improvement in patient's visual function within 90 days following cataract surgery. San Francisco (CA): American Academy of Ophthalmology (AAO); 2014 Oct. 6 p. [27 references]

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Outcome

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure is used to assess the percentage of patients aged 18 years and older in sample who had cataract surgery and had improvement in visual function achieved within 90 days following the cataract surgery, based on completing a pre-operative and postoperative visual function survey.

Rationale

1. Scientific basis for measuring visual function outcomes after cataract surgery.
   Visual function has been described as having multiple components, including central near, intermediate, and distance visual acuity; peripheral vision (Brenner et al., 1993); visual search; binocular vision; depth perception; contrast sensitivity; perception of color; adaptation; and visual processing speed (Sloane et al., 1992). Visual function also can be measured in terms of functional disability caused by visual impairment (Steinberg et al., "The VF-14," 1994). Many activities are

affected by more than one of these visual components.

Health services researchers have increasingly emphasized function and quality of life as the outcomes of treatment that are most critical and applicable to the patient. As previously stated, the primary purpose in managing a patient with cataract is to improve functional vision and the quality of life. In well designed observational studies, cataract surgery consistently has been shown to have a significant impact on vision-dependent function. The Cataract Patient Outcomes Research Team (PORT) reported that 90% of patients under-going first-eye cataract surgery noted improvement in functional status and satisfaction with vision (Schein et al., 1994). The Activities of Daily Vision Study of elderly patients with a high prevalence of coexisting ocular and medical diseases reported improved visual function in 80% of patients at 12 months after surgery (Mangione et al., 1994). A National Cataract Study conducted in England of 1,139 patients who had cataract surgery found that preoperative functional impairment varied in relation to gender, age, and visual acuity. Men were more likely to have trouble with driving, glare, and employment, and women were more likely to have difficulties with activities of daily living and recreational activities (Desai, Minassian, & Reidy, 1999). Studies have found that regardless of the preoperative visual acuity in the better eye, most patients reported improvement in their ability to perform visually dependent tasks after undergoing cataract surgery (Schein et al., 1994; Mangione et al., 1994; Desai, Minassian, & Reidy, 1999).

Several studies have reported an association between improved visual function after cataract surgery and improved health-related quality of life (Brenner et al., 1993; Mangione et al., 1994; Mönestam & Wachtmeister, 1999; Steinberg et al., "National study," 1994). Visual function plays an important role in physical function, particularly in terms of mobility (Damiano et al., 1995). The loss of visual function in the elderly is associated with a decline in physical and mental functioning as well as in independence in activities of daily living (Salive et al., 1994), including night-time driving, daytime driving, community activities, and home activities. Elderly patients with visual impairment only (and no other physical or mental impairments) were 2.5 times as likely to experience functional decline than elderly patients without visual impairment.

Improved visual function following cataract surgery can ameliorate the progressive deterioration of quality of life seen in elderly patients (Brenner et al., 1993; Mangione et al., 1994). In a cohort of 464 patients 65 years old and older, cataract extraction improved visual function and health-related quality of life. Patients with an improvement in their Activities of Daily Vision Scale (ADVS), a brief measure of vision-specific functional status (Laforge, Spector, & Sternberg, 1992), had from 10% to 59% less decline in nearly all Short Form (SF)-36 dimensions (Mangione et al., 1994). The SF-36 is a generic global measure of multidimensional health-related quality of life (Mangione et al., 1992). A nationally representative population of 7,114 persons who were 70 years old and older showed that limitations in vision correlated with decreased functional status (Ware & Sherbourne, 1992). The unadjusted functional score of a person with reported poor vision was four times worse than the score for a person with excellent vision (Ware & Sherbourne, 1992). This difference was comparable with the differences found in other chronic conditions such as arthritis. This relationship with vision persisted, even after adjustment for health, demographics, and economic status. Individuals who rated their vision as other than excellent reported worse functional status, even when controlled for the presence of other medical conditions, education, income, general health status, and other symptoms. By improving visual function, cataract surgery may play an important role in preserving overall functional status, reducing associated injuries and accidents, and preventing disability in at-risk elderly patients (Salive et al., 1994).

An analysis of the Medical Outcomes Study found that having blurred vision more than once or twice a month has a significant impact on functional status and well-being, particularly on problems with work or other daily activities as a result of physical health (Lee, Smith, & Kington, 1999). This impact was found to be greater than the impact of several other chronic conditions, such as hypertension, history of myocardial infarction, type 2 diabetes mellitus, indigestion, trouble urinating, and headache. In one study, patients planning to undergo cataract surgery assigned a mean preoperative preference value of 0.68 on a scale ranging from 0 to 1 (where 0 is death and 1 is excellent health), indicating that the visual impairment from cataracts had a substantial impact on

their quality of life (Laforge, Spector, & Sternberg, 1992). Visual impairment is an important risk factor for falls (Lee, Spritzer, & Hays, 1997) and for hip fracture (Tinetti, Speechley, & Ginter, 1988). Specifically, the Study for Osteoporotic Fractures Research Group found that poor depth perception and decreased contrast sensitivity independently increased the risk of hip fracture (Felson et al., 1989).

Visual impairment, in particular a decrease of visual acuity and contrast sensitivity, has been shown to be associated with difficulties in driving (Cummings et al., 1995). In one study, older drivers with visually significant cataract were twice as likely as older drivers without cataract to report reduction in days driven and four times as likely to report difficulties in challenging driving situations (McGwin, Chapman, & Owsley, 2000). Drivers with visually significant cataract were 2.5 times more likely to have had an at-fault involvement in a motor vehicle crash in the past 5 years compared with drivers without cataract (McGwin, Chapman, & Owsley, 2000). This association was significant, even after accounting for other factors such as impaired general health, age, mental status deficit or depression. In this study, visually significant cataract was determined by reviewing the participant's medical record and most recent eye examination by an eye care specialist. The study required that cataract in both eyes was the cause of the visual impairment, based on the medical record; an additional inclusion criterion was best corrected visual acuity in one eye of 20/40 or worse. A further study in the same group demonstrated that drivers with a history of crash involvement were eight times more likely to have a serious contrast sensitivity deficit (defined as a Pelli-Robson score of 1.25 or less) in the worse eye than those who had no history of crash involvement (Owsley et al., 1999). A severe contrast sensitivity deficit in only one eye was still significantly associated with crash involvement (Owsley et al., 1999).

Binocular vision is better than the vision of a single eye. The simultaneous use of the two eyes is complex and requires the integration of disparate images from each eye. A study demonstrated that binocular vision resulted in better perception of form, color, and the relationship of the body to the environment, which facilitated manipulation, reaching, and balance, particularly under dim illumination (Owsley et al., 2001). However, if the vision of one eye is reduced due to cataract, visual performance can fall below the level of monocular vision by a mechanism known as binocular inhibition (Jones & Lee, 1981), which reduces patients' visual acuity and contrast sensitivity (Pardhan & Gilchrist, 1991). A study of the Framingham Study Cohort found that poor vision in one or both eyes was associated with an increased risk of hip fracture. It also found that patients with good vision in one eye and moderately impaired vision in the other eye had a higher risk of fracture than those with similar visual impairment in both eyes (Taylor, Misson, & Moseley, 1991). A study of 150 patients before and after cataract surgery found that poor binocular visual acuity was related to more problems in activities of daily living (Lundström, Fregell, & Sjöblom, 1994). Another study, based on patients who reported no beneficial outcomes after first-eye cataract surgery in the National Swedish Cataract Outcome register, found that anisometropia was the reason for the poor outcome in one-third of cases (Lundström et al., 2000). These studies have shown that second-eye surgery is important to visual and physical function.

In summary, these studies demonstrate that physical function, emotional well-being, and overall quality of life can be enhanced when visual function is restored by cataract extraction (Cataract Management Guideline Panel, 1993).

Improved visual function as a result of cataract surgery includes the following:

- Better optically corrected vision
- Better uncorrected vision with reduced spectacle dependence
- Increased ability to read or do near work
- Reduced glare
- Improved ability to function in dim levels of light
- Improved depth perception and binocular vision
- Improved color vision

Improved physical function as a critical outcome of cataract surgery includes the following:

- Increased ability to perform activities of daily living
- Increased opportunity to continue or resume an occupation
- Increased mobility (walking, driving)

Improved mental health and emotional well-being as a second critical outcome of cataract surgery includes the following benefits:

- Improved self-esteem and independence
- Increased ability to avoid injury
- Increased social contact and ability to participate in social activities
- Relief from fear of blindness

Most patients achieve improved visual function after cataract surgery. This outcome is achieved consistently through careful attention through the patient selection process, accurate measurement of axial length and corneal power, appropriate selection of an intraocular lens (IOL) power calculation formula, etc. As such, it reflects the care and diligence with which the surgery is assessed, planned and executed. Failure to achieve this after surgery would reflect patterns of patient selection or treatment that should be assessed for opportunities for improvement.

Sometimes cataract surgery is performed for other medical reasons other than to improve impaired visual function caused by cataract. These circumstances include the following: clinically significant anisometropia in the presence of a cataract; when the lens opacity interferes with optimal diagnosis or management of posterior segment conditions, when the lens causes inflammation (phacolysis, phacoanaphylaxis) and when the lens induces angle closure (phacomorphic or phacotopic). In these situations, improved visual function as a result of the removal of the cataract is not expected, because of the pre-existing comorbid conditions.

2. Evidence of a gap in care
   This is an outcome of surgery indicator of direct relevance and import to patients, their families and referring providers. The available evidence suggests that cataract surgery achieves this in about 90% of patients. While the potential for improvement is seemingly small, the volume of cataract surgery in the United States (U.S.) of over 2.8 million surgeries means that the impact could affect more than 100,000 patients per year. Ideally, performance on this indicator would be as high as possible, with lower rates suggestive of opportunities for improvement.

Evidence for Rationale

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Primary Health Components

Eye care; cataract surgery; visual function

Denominator Description

All patients aged 18 years and older who had cataract surgery (see the related "Denominator Inclusions/Exclusions" field)

Numerator Description

Patients 18 years and older who had improvement in visual function achieved within 90 days following cataract surgery, based on completing a pre-operative and post-operative visual function survey (see the related "Numerator Inclusions/Exclusions" field)

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

A clinical practice guideline or other peer-reviewed synthesis of the clinical research evidence

A systematic review of the clinical research literature (e.g., Cochrane Review)

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

Unspecified

Extent of Measure Testing

Unspecified

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Ambulatory/Office-based Care

Ambulatory Procedure/Imaging Center

Hospital Outpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Individual Clinicians or Public Health Professionals

Statement of Acceptable Minimum Sample Size

Specified

Target Population Age

Age greater than or equal to 18 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Data Collection for the Measure

Case Finding Period

The reporting period

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Patient/Individual (Consumer) Characteristic

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

All patients aged 18 years and older who had cataract surgery

Note: Refer to the original measure documentation for administrative codes.

Exclusions
Unspecified

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions
Patients 18 years and older who had improvement in visual function achieved within 90 days following cataract surgery, based on completing a pre-operative and post-operative visual function survey

Note:
â€‹â€‹â€‹â€‹â€‹*Improvement in Visual Function*: The strategy to identify improvement in visual function is as follows. The instrument proposed for visual function evaluation is the Rasch-scaled Short Version of the Visual Function-14 (VF-8R). Reliability and validity testing have been performed on the VF-14 as well as the VF-8R. This instrument is scored on a scale of 0-100, with 0 indicating the lack of ability to perform functional activities and 100 indicating complete ability to perform functional activities. The difference between the pre-operative and post-operative scores on the VF-8R indicates a change in functional activities. Improvement in visual function would be defined as an increase in the visual function score between pre-operative and post-operative assessment on the VF-8R in the range of 5 points or greater.

Exclusions
Patient care survey was not completed by patient

Numerator Search Strategy

Fixed time period or point in time

Data Source

Administrative clinical data

Registry data

Type of Health State

Clinically Diagnosed Condition

Instruments Used and/or Associated with the Measure

Rasch-scaled Short Version of the Visual Function-14 (VF-8R)

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a higher score

Allowance for Patient or Population Factors

not defined yet

Standard of Comparison

not defined yet

Identifying Information

Original Title

Measure #303: cataracts: improvement in patient's visual function within 90 days following cataract surgery.

Measure Collection Name

Eye Care Quality Measures

Submitter

American Academy of Ophthalmology - Medical Specialty Society

Developer

American Academy of Ophthalmology - Medical Specialty Society

Funding Source(s)

American Academy of Ophthalmology

Composition of the Group that Developed the Measure

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Financial Disclosures/Other Potential Conflicts of Interest

None

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2013 Apr 11

Measure Initiative(s)

Ambulatory Surgery Center Quality Reporting Program

Hospital Compare

Hospital Outpatient Quality Reporting Program

Physician Quality Reporting System

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2014 Oct

Measure Maintenance

Reviewed and updated if appropriate on an annual cycle.

Date of Next Anticipated Revision

2016

Measure Status

This is the current release of the measure.

The measure developer reaffirmed the currency of this measure in December 2015.

Measure Availability

Source not available electronically.

For more information, contact the American Academy of Ophthalmology (AAO) at 655 Beach Street, San Francisco, CA 94109; Phone: 415-561-8500; Fax: 415-561-8533; Web site: www.aao.org .

NQMC Status

This NQMC summary was completed by ECRI Institute on April 30, 2015. The information was verified by the measure developer on May 19, 2015.

The information was reaffirmed by the measure developer on December 16, 2015.

Copyright Statement

Production

Source(s)

American Academy of Ophthalmology (AAO). Cataracts: improvement in patient's visual function within 90 days following cataract surgery. San Francisco (CA): American Academy of Ophthalmology (AAO); 2014 Oct. 6 p. [27 references]

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